CURRICULUM VITÆ
Ferdinando Cannella, PhD

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Personal Data

Address

Phone
Mobile
Email

Biography

He graduated in Mechanical Engineering at University Polytechnic of Marche, Italy, (UnivPM) in 1998 discussing the thesis "Numerical Study and Experimental Validation of Synchronous Belts".

PhD in 2002 in "Mechanical Measurement applied to Engineering" discussing the thesis "Optical Measurement of strain: Application on Timing Belt"; University of Padua (Italy).

PhD in 2006 in "Mechanical Engineering" at UnivPM discussing the thesis "Stiffness Modelling and Kinematic Analysis of Carton Handling and Manipulation with a Reconfigurable Mechanism using Numerical Simulation". This thesis was mainly developed at King's College of London (UK) under the supervision of Prof. Jian S. Dai.

From 1998 to 2015, he has been collaborating at Department of Industrial Engineering and Mathematical Sciences (DIISM) of UnivPM Thanks to his skills in creating and validating numerical models and in virtual prototyping, he worked in several European Projects and Italian Grants together with Prof E. P. Tomasini. He taught Finite Element Model applied to dynamics embedded in the Course "Mechanics of Vibrations" and from 2005 to 2015 he has been tutoring various under-graduate and post-graduate students.

In 1998 he won a three years scholarship by MARKIV AUTOMOTIVE S.p.A. to continue the research activity carried out while working at his degree thesis. He continued his co-operation with the company until 2002 working in *virtual prototyping* of the timing belt. This experience gave him the opportunity to deepen his knowledge of Nonlinear Numerical Simulations applied to Finite Element and Multi-body Analysis.

He worked in several European Integrated Projects granted to Prof Tomasini at UnivPM; among them the research activities carried out during his PhD cover particularly *vibration measurements by tracking techniques* applied to the study of shape and strain of a timing belt tooth. He implemented the driving mechanism of the tracking Laser beam to improve its velocity and accuracy in measurements. All his experimental models were investigated via finite element analysis.

From 1999 to 2002 he worked with Prof M. Callegari, Professor of *Applied Mechanics* at the Dept. of Mechanics of UnivPM, in the Robotic field. In particular, he carried out research activities on Parallel Kinematics Machines. Furthermore he co-operated to two projects in this area regarding applications in the industrial and in the medical fields.

From 2001 to 2002, he was tutor in the courses of *Applied Mechanics* on NETTUNO University and on Ente Universitario di Fermo (Italy).

Since 2001 he has been working with Prof J. S. Dai of King's College of London, UK (KCL) on *Dynamic Analysis of Carton Handling and Manipulation in Packaging Automation Based on the Equivalent Mechanism*. He spent six months at King's College of London within 2001 to 2003.

From January 2005 to 2012 he has been working at KCL as Post-doctoral Visiting Researcher in the ARCHAPS (Automatic Reconfigurable Confectionary Handling and Packaging System) project sponsored by DEFRA/EPSRC. The aim of this collaboration was to improve the knowledge in carton crease behaviour. Several experimental tests have been carried out in different laboratories in England and Italy in order to investigate the carton folding. From this work, Cannella and Dai worked on this field, publishing two important papers. Several test rigs and several equipment have been built and used.

In 2006 he was Post-Doc at UnivPM in 2007 he won a grant from the company Merloni S.p.A. to carry out research activity in three different fields: numerical modelling, measurements and kinematics.

From 2008 to 2010 he worked as a Senior Post-Doc at the Italian Institute of Technology (IIT) with Prof Darwin Caldwell, and from 2010 he was appointed as a Researcher at IIT and since then he serves as a Team Leader

In 2015 he founded Advanced Industrial Automation Lab within Advanced Robotics Department at IIT and since then he acts as the head of the Lab. The activities of the laboratory mainly deal with the development of Industrial Robotics applications sponsored by both competitive EU/National research projects and contracts with private companies.

From 2019 Cannella is the head of the newest Industrial Robotic Unit focused on industrial research and applications about soft material manipulation, elastic robot control, reconfigurable grippers and inspection and maintenance.

He is currently also responsible for the Robotics Macronode of the Competence Centre ARTES 4.0, member of the Technical Scientific Committee of the Competence Centre START 4.0 and of the DIH Liguria. He published more than 100 papers on different research topics and in particular on industrial robotics and he issues several patents; last not least he won national and international industrial robotic/applications challenges. Moreover member of IEEE and ASME.

He has a significant experience in using finite element analysis, multi-body simulation tools for Co-Simulation (Multi-body, Finite Element, Control and Optimization Tools) to investigate and develop reconfigurable mechanisms exploiting the bio-inspiration models to investigate and develop new grippers or manipulators for industrial robotics research and applications.

The main topics of his research are:

- grasping and in-hand manipulation applied to the industrial manufacturing; this success come mainly from his experiences on reconfigurable mechanisms developed during his 2nd PhD and those achievements led Cannella to be co-investigators in AUTORECON, EuroC and SoftManBot EU Projects and to be the P.I. in Research Projects with GE Avio Group and Fameccanica S.p.A. which results was also several journal papers and one patents accepted and three ones on processing;
- flexible structure modelling applied mainly on deformation control in robotic manipulators: that permits to recover the inaccuracy and discrepancy between the input and output in robotic dynamic control; this experience was improved during his 1st PhD and let Cannella to be P.I. in researchers project with other IIT research groups as iCub Facility, university as UnivPM and Università of Modena and Reggio Emilia (Italy) and companies as Tetra Pak, MSC.software, Ansaldo Energia and Axist;
- new models and measurement devices for haptic investigation, in particular tactile cue is explored in depth not only to increase the knowledge necessary for biological representation, but also to design new test-rigs for clinical applications; successful results let to be granted by WEARHAP EU Project where Cannella has served as task leader; the outcomes of this research was the ARDITA (patented) and, more recently, ReMoChIll (patent in submission) devices in testing in hospitals under the Italian Protocol 543REG2015. Several high standard journal papers and honours has come from this research.
- inspection and maintenance robots is the most recent topic based on the reconfigurable mechanisms and mobile robots; the first research results were applied for the inspection of the Ansaldo Energia generators and turbines, while the main ones for development of two innovative robots (patented) that are going be used for the inspection and maintenance of the new Polcevera bridge (collapsed on August 2018 and will be accomplished by July 2020).

Education

- 2009 *Post-Graduate Specialization* in "Mechatronics" –- TCN Consortium for Higher Education
- 2006 *2nd PhD degree* in "Mechanical Engineering", University Polytechnic of Marche
- 2002 *1st PhD degree* in "Mechanical Measurements Applied to the Engineering", - University of Padua
- 2001 *National Habilitation to Practice the Profession of High School Teacher* in "Technology and Design" (Qualification)
- 1998 *National Habilitation to Practice the Profession of Engineer*, University of Ancona (current University Polytechnic of Marche)
- 1998 *Laurea degree in Mechanical Engineering* – University of Ancona (current University Polytechnic of Marche)

Work Experiences

- 2019 to present: Head of Industrial Robotic Unit at Italian Institute of Technology (Genoa, Italy)
- 2015 to present: Researcher at Italian Institute of Technology (Genoa, Italy)
- 2015-2019 Head of Advanced Industrial Automation at Italian Institute of Technology (Genoa, Italy)
- 2010-2015 Senior Post Doctoral Research at Italian Institute of Technology (Genoa, Italy)
- 2008-2010 Junior Post Doctoral Research at Italian Institute of Technology (Genoa, Italy)
- 2008 Post Doctoral Research at University Polytechnic of Marche (Ancona, Italy)
- 2005-2012: Visiting Research Associate at King's College London, University of London, (London, UK)
- 2001-2005 Visiting PhD Student at King's College London, University of London, (London, UK)

Professional Activities (project-based contract with industries)

- 2018 (lectures) Sistemi Formativi Confindustria Umbria, Training on "Robotic Virtual Prototyping Design"
- 2009 (design) iGUZZINI S.p.A. "Design of Beam for New Public Light Lamp"
- 2008 (design) SOGEMI S.p.A. (Osimo - AN, Italy) "Static Finite Element Analysis of Automotive Lock"
- 2008 (design) Nuova Simonelli (Belforte Del Chienti - MC, Italy) "Coffee machine thermal analysis of water flowing during the coffee production"
- 2007 (design) VIC S.p.A. (Fossato di Vico - PG, Italy) "Basic and Advanced Finite Element Course using CosmosWork2007: Linear, Non-Linear, Contact and Plasticity Analysis"
- 2005 (design) LAVINYA "Web site maintenance"
- 2005 (lectures) MAIT S.p.A. (Osimo - AN, Italy) "Basic and Advanced Finite Element Course using Finite Element: Linear, Non-Linear, Contact and Buckling Analysis"
- 2003 (design) DAFRAM S.p.A. (Urbisaglia - MC, Italy) "Structural Analysis of Top Entry Valve "
- 2002 (design) iGUZZINI S.p.A. "Design of Beam for New Public Light Lamp"
- 2001 (design) DAFRAM S.p.A. (Urbisaglia – MC, Italy) "Stress and Strain computational of Ball Valves"

Granted Projects:

European Research grants:

- **2023-2026 HORIZON-CL4-2022 MASTERLY,** CalLHORIZON-CL4-2022-TWIN-TRANSITION-01 **GA101091800** Multi-disciplinary Smart Mechatronics for Intelligent Workpiece (WP Leader, Budget: 560k€)
- **2019-2023 H2020-FoF-11 SoftManBot, GA869855** Advanced Robotic Technology for Handling Soft Materials in Manufacturing Sectors (WP Leader, Budget: 700k€)
- **2013-2017 FP7-ICT-2011-9 WEARHAP, GA601165** wearable haptics for humans and robots (task leader, Budget: 25k€)
- **2011-2014 FP7-FoF.NMP.2011-AUTORECON: GA285189** (AUTOnomous Cooperative machines for highly RECONfigurable assembly operation of the future) cooperative machines and open-architecture control systems (WP Leader, Budget: 650k€)

Granted Projects which I have been working with:

- **2015-2018 FP7-EuRoC:** European Robotics Challenges – AutoMAP (co-writer of proposal, Budget: 585k€)
- **2010-2012 COMAN:** compliance humanoid; project developed within FP7 AMARSI (Adaptive Modular Architectures for Rich motor Skills) (internal co-responsible of activity)
- **2009-2013 FP7 OCTOPUS:** Novel Design Principles and Technologies for a New Generation of High Dexterity Soft-bodied Robots Inspired by the Morphology and Behaviour of the Octopus (internal co-responsible of activity)
- **2002-2005 FP5 LASERACT:** laser multitask non-destructive technology in conservation diagnostic procedures (internal co-responsible of activity)
- **1997-2000 FP4 - BRITE/EURAM 3, IMPACT:** Integrated Manufacturing and Production Automation for the Ceramic Tile Industry (internal co-responsible of activity)
- **1997-2000 FP4-SMT DOPTEST:** hand-arm vibration measurement by laser vibrometer aimed at product development and optimization (internal co-responsible of activity)
- **1996-2000 FP4-SMT LASERART:** Non-intrusive laser measurement techniques for diagnostic of the state of conservation of frescoes painting and wooden icons (internal co-responsible of activity)

National Research grants:

- **2023-2025 Cittadella delle Tecnologie Emergenti (Italy):** Cittadella delle Tecnologie Emergenti (Italy) (WP Leader, Budget: 550k€)
- **2022-2025 RAISE (Italy):** Robotics and AI for socio-economic empowerment (PNRR-M4C2-I1.5) (WP Leader, Budget: 350k€) (https://www.raiseliguria.it/)
- **2020-2022 IRCRAM 4.0 (Italy):** International Research Center for Robot and Additive Manufacturing: 4.0, "Hub Ricerca e Innovazione" of Regione Lombardia (WP Leader, Budget: 800k€) (https://www.openinnovation.regione.lombardia.it/it/b/17088/international-research-center-for-robot-and-additive-manufacturing)
- **2019-2022 START 4.0 (Italy):** Centro di Competenza per la sicurezza e l'ottimizzazione delle infrastrutture strategiche, National Competence Center (Technical Committee Member)
- **2019-2022 ARTES 4.0 (Italy):** Advanced Robotics and enabling digital TEchnologies & Systems 4.0, National Competence Center (Macronode Leader, Budget: 1.400k€)

National Research Grants which I have been working with:

- **2004-2008 ARCHAPS (UK):** Automatic Reconfigurable Confectionery Handling and Packaging System, (Task Leader)

IIT internal Funded Projects:

- **2016-present FlegX:** Flexible Leg, (scientific responsible, 65k€)
- **2014-present ReMoChIll:** Remote Monitoring Chronical Illness, (scientific responsible, 40k€)
- **2011-present ARDITA** autonomous and reconfigurable dynamic investigation test-rig on haptic (scientific responsible, 40k€)
- **2008-2011 DITA** dynamic investigation test-rig on haptic (scientific responsible, 20k€)

- **2007-2015 Quadruped Leg Dynamics:** application to HYQ hydraulic quadruped (internal co-responsible of activity)

Industrial contracts:

- **2019-21** **Camozzi (Italy):** Robots for Bridge Inspection and Maintenance (scientific responsible)
- **2019-20** **Axist (Italy):** Robotic Elastic Compliant Control Balancing (scientific responsible)
- **2018-19** **Novacart (Italy):** Interface for Automated (scientific responsible)
- **2018-20** **Ansaldo Energia (Italy):** mobile robot for combustion chamber inspection (scientific co-responsible)
- **2017-19** **Luxottica(Italy):** Quality Control of Eyewear (scientific responsible)
- **2017-20** **Joint Lab IIT-Camozzi (Italy):** smart manipulation (scientific co-responsible)
- **2017-18** **Ansaldo Energia (Italy):** mobile robot for electrical generator inspection (scientific co-responsible)
- **2016-20** **Fameccanica(Italy):** Novel gripper for bottle handling application and flexible tape manipulation (scientific responsible)
- **2015** **NewRe NetWind (Italy):** Numerical Modelling of Transportable Micro Wind Turbine Efficiency (scientific responsible)
- **2014-15** **Tetra Pak (Italy):** Crease Stiffness Modelling (scientific responsible)
- **2014-17** **AVIO group (Italy):** Automatic Inspection And Assembling (scientific responsible)
- **2012** **Fustellificio PM Ltd (Italy):** Feasibility Study of Press knife blade bending device (scientific responsible)
- **2007-2008** **MERLONI (Italy):** multi-body model validated by measurement for prediction and reduction of sound power emission of washing machine (scientific co-responsible)
- **2004-2005** **DENTAL CLINIC** (University Polytechnic of Marche) (Italy): tooth implants investigation by finite element model for increment of durability (scientific co-responsible)
- **2003-2004** **VGF (Italy):** numerical model for automatic design and structure, fluid-dynamics and noise optimization of inlet-outlet pipe of power station turbine (internal co-responsible of activity)
- **2002-2003** **iGUZZINI S.p.A. (Italy):** investigation and optimisation of stress and strain in cantilever illumining apparatus by finite element analysis (scientific co-responsible)
- **2000-2002** **SAIPEM S.p.A. (Italy):** finite element model for design of an Active Automated System for the Control of Stinger/Pipe Reaction Forces of a Marine Pipelaying System (scientific co-responsible)
- **1999-2000** **iGUZZINI S.p.A. (Italy):** numerical model numerical model validated by measurements for investigation and optimisation of temperature and fluid-dynamics of illumining apparatus (scientific co-responsible)
- **1999-2000** **MARKIV AUTOMOTIVE S.p.A. (Italy):** numerical model of tooth deformation (scientific co-responsible)
- **1996-1999** **MARKIV AUTOMOTIVE S.p.A. (Italy):** numerical model validated by measurements for investigation and reduction of timing belt sound power emission (internal co-responsible of activity)

Teaching Experience

Lecturer for University Courses

2022 PhD Course in "Robotic Virtual Prototyping Design", PhD School, Italian Institute of Technology, Genova (Italy) – 5 Credits

2021 PhD Course in "Robotic Virtual Prototyping Design", PhD School, Italian Institute of Technology, Genova (Italy) – 5 Credits

2020 PhD Course in "Robotic Virtual Prototyping Design", PhD School, Italian Institute of Technology, Genova (Italy) – 5 Credits

2019 PhD Course in "Robotic Virtual Prototyping Design", PhD School, Italian Institute of Technology, Genova (Italy) – 5 Credits

2018 PhD Course in "Robotic Virtual Prototyping Design", PhD School, Italian Institute of Technology, Genova (Italy) – 5 Credits

2017 PhD Course in "Robotic Virtual Prototyping Design", PhD School, Italian Institute of Technology, Genova (Italy) – 5 Credits

2016 PhD Course in "Robotic Virtual Prototyping Design", PhD School, Italian Institute of Technology, Genova (Italy) – 5 Credits

2015 Course in "Virtual Prototyping Development on Robotic Design", 16-21st August 2015, School of Mobile Information and Engineering, Zhuhai Campus, Sun Yat-Sen University, Zhuhai (China)

2015 PhD Course in "Robotic Virtual Prototyping Design", PhD School, Italian Institute of Technology, Genova (Italy) – 5 Credits

2014 PhD Course in "Virtual Prototyping Design", PhD School, Italian Institute of Technology, Genova (Italy) – 5 Credits

2013 PhD Course in "Virtual Prototyping Design", PhD School, Italian Institute of Technology, Genova (Italy) – 5 Credits

2012 PhD Course in "Virtual Prototyping Design", PhD School, Italian Institute of Technology, Genova (Italy) – 5 Credits

2011 PhD Course in "Virtual Prototyping Design and Experimental Validation", PhD School, Italian Institute of Technology, Genova (Italy)

2005-2008 B.Sc. Laboratory lectures, course "Mechanical Measurements", Prof. E. P. Tomasini, University Polytechnic of Marche (Ancona, Italy)

2005-2008 B.Sc. Laboratory lectures, course "Mechanical Measurements", Prof. P. Castellini, University Polytechnic of Marche (Ancona, Italy)

2003 M.Sc. Short course in "Mechanical Vibrations", course, Prof. J. S. Dai, King's College of London, London (UK)

2000-2002 B.Sc. Tutor in "Mechanics Applied to the Mechanism", Prof. M. Callegari, University of Fermo

2000-2002 B.Sc. Tutor in "Applied Mechanics", Prof. M. Callegari, Nettuno, E-learning University

2000-2002 B.Sc. Co-lecture in "Applied Mechanics", Prof. M. Callegari, University Polytechnic of Marche (Ancona, Italy)

1998-2008 M.Sc. Short course in "Finite Element Model applied to the Dynamics of Mechanism", Course of "Mechanics of Vibrations", Prof. Tomasini, University Polytechnic of Marche (Ancona, Italy)

Supervisor of PhD Theses

2025 PhD Marcel Lahoud Russo

2024 PhD Farshad Harari

2024 PhD Lizhou Xu

2022 PhD Sergio Leggieri, Novel Crawler Unit of a Hybrid Platform for Infrastructure Inspection: Modelling, Design and Control, University of Bergamo, Bergamo (Italy)

2022 PhD Claudio Gloriani, Industrial Sorting Gripper for Handling Tissue Goods: Design and Development, University of Bergamo, Bergamo (Italy)

2021 PhD Daniele Ludovico, Modelling and Control of Cable-Driven Hyper-Redundant Robots, Italian Institute of Technology, Genova (Italy)
2018 PhD Nahian Rahman, Towards Developing Gripper to obtain Dexterous Manipulation, Italian Institute of Technology, Genova (Italy)
2017 PhD Maria Laura D'Angelo, Study of Fingertip Tactile Sensitivity and Mechanical Properties Correlation, Italian Institute of Technology, Genova (Italy)
2016 PhD Maria Paola D'Imperio, Modelling and Simulation Techniques for Advanced Robotic Systems, Italian Institute of Technology, Genova (Italy)
2012 PhD Valente Massimiliano, Role of feedback for performance and learning in virtual reality interaction, Italian Institute of Technology, Genova (Italy)
2009 PhD Clari Daniele, Dynamic modelling and validation of a washing machine for predicting acoustic (in Italian) University Polytechnic of Marche (Ancona, Italy)

Supervisor of B.Sc. and M.Sc. Theses

1. 2020 M.Sc. Marco Fiori, Experimentation and Numerical Modelling for Calculation of Torque Generated by Gaskets in Recirculating Ball Screws for Aeronautical Use (University of Perugia, Perugia, Italy).
2. 2019M.Sc. Francesco Lasagni, Design and Simulation of a Gravity Compensator with a Noncircular Pulley - Spring Mechanism (Polytechnic of Turin, Turin, Italy).
3. 2018 M.Sc. Francesco Bonicelli, FlegX: Characterization and Control of a Flexible Robotic Leg (Polytechnic of Turin, Turin, Italy).
4. 2017M.Sc. Pangcheng David Cen Cheng, Control of a Handling System for Ultra-Thin and Soft Breathing Baby Diapers (Polytechnic of Turin, Turin, Italy).
5. 2017 M.Sc. Daniele Ludovico, FlegX: Design and Control of a Flexible Robotic Leg (Polytechnic of Turin, Turin, Italy).
6. 2017 M.Sc. Paolo Guardiani, Development of Inspection Snake Robot (Polytechnic of Turin, Turin, Italy).
7. 2015 M.Sc. Umberto Salvi, Novel Gripper for Standard Part Installing (Polytechnic of Turin, Turin, Italy).
8. 2013 M.Sc. Memeo Mariacarla, Development of a device for Tactile Sensing (University Polytechnic of Marche, Ancona, Italy)
9. 2012 M.Sc. Olivieri Emidio, A.R.D.I.T.A – Autonomous and reconfigurable dynamic investigation test-rig on haptics (University Polytechnic of Marche, Ancona, Italy)
10. 2012 B.Sc. Laureati Giulio, Characterization of a test-rig for measurement of tactile sensibility (University Polytechnic of Marche, Ancona, Italy)
11. 2011 B.Sc. Acciaioli Alice, Experimental campaign and testing in tactile sensing and haptic (University Polytechnic of Marche, Ancona, Italy)
    11.1. Rossi Bernardo, Data-characterization of the finger tactile sensitivity: development of an automatic procedure for the analysis of data (University Polytechnic of Marche, Ancona, Italy)
12. 2010 B.Sc. Iannantuono Carlo, Effect of density and the size of micro actuators on the tactile sensitivity of volunteer subjects (in Italian) (University Polytechnic of Marche, Ancona, Italy)
    12.1. Memeo Mariacarla, Measurement procedure development and testing in tactile sensing and haptics, (University Polytechnic of Marche, Ancona, Italy)
    12.2. Romeo Rocco Antonio, Development and testing of the measuring bench tactile sensitivity (in Italian), (University Polytechnic of Marche, Ancona, Italy)
13. 2010 M.Sc. Pupilli Mirko, Mechanical properties of creases paperboard for packaging materials and robotic folding technology, (University Polytechnic of Marche, Ancona, Italy)
14. 2008 B.Sc. Clerico Daniele, Dynamic characterization of a brake gearmotors: finite element analysis and experimental tests (in Italian), (University Polytechnic of Marche, Ancona, Italy)
15. 2007 M.Sc. Sciapichetti Stefano, Study of the operating conditions of an instrument for measuring micrometric and without contact of a slider for hydraulic systems (in Italian), (University Polytechnic of Marche, Ancona, Italy)
16. 2007 B.Sc. Spinaci Paolo, Dynamic analysis of a laundry washing machine (in Italian), (University Polytechnic of Marche, Ancona, Italy)

17. 2005 M.Sc. Pallotto Lucia, Development and evaluation of a 3D FEM model and parameterized for the finite element analysis of dental (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 17.1. Fani Piero, Study of the behaviour of damaged composite microstructure and elastic long fiber using the finite element method (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 17.2. Ponzelli Elisabetta, Study for the construction of a prosthetic femoral external endoskeleton with native materials to children and women victims of landmines Senegalese, Doman project (in Spanish), (University Polytechnic of Marche, Ancona, Italy)
18. 2004 M.Sc. Feligiotti Mara, Development of numerical models for the simulation of defects in artistic and experimental verification (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 18.1. Caso Tammaro, Electromechanical characterization of m.e.m.s. resistive switches for RF circuits using finite element numerical modeling and experimental investigation through the use of laser doppler microvibrometria (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 18.2. Caputo Antonio, Evaluation of the mechanical behavior of an orthodontic system: development of a fem model and experimental analysis (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 18.3. Farano Addolorata, Evolutionary analysis of the interaction between concrete frames and masonry courses in seismic behavior (in Italian), (University Polytechnic of Marche, Ancona, Italy)
19. 2003 M.Sc. Marinelli Nicola, Finite element modeling and experimental verification of the dynamic behavior and sound speakers for automotive applications (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 19.1. Antonini Marco, Sperimental analysis and numerical evaluation of fiber reinforced composites in clinical dentistry (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 19.2. Fiorelli Matteo, Analysis and optimization of the performance of a dental implant: development of a finite element method and experimental validation (in Italian), (University Polytechnic of Marche, Ancona, Italy)
20. 2001 M.Sc. Bernardo Claudio, Application of methods of experimental and numerical investigation on the dynamic characterization of automotive components (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 20.1. Copparoni Mauro, Development of a theoretical-experimental methodology for the characterization of dentures in dental clinic (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 20.2. Suardi Alessandra, Kinematic study and design of the monitoring system for the control of a robot for motions parallel planes (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 20.3. Vitri Giuseppe, Numerical simulation of manufacturing processes and conditions of installation of steel pipes for submarine applications (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 20.4. Lanari Stefano, Study of the launch of pipelines in deep waters: analytical models and finite element approach (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 20.5. Scocco Marco, Project of an innovative machine in parallel kinematic (in Italian), (University Polytechnic of Marche, Ancona, Italy)
21. 2000 M.Sc. Titti Filippo Maria, Development of an innovative system for the control of reactions on the launch ramp for deep water subsea pipeline (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 21.1. Gucciardi Fabrizio, Dynamic modelling of a city-car and electrical proposal of the control system for actuating a drive-by-wire (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 21.2. Monti Sergio, Dynamic analysis of a Cartesian robot high performance (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 21.3. Tarantini Matteo, Functional design of a robot for motions of pure translation parallel architecture innovative (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 21.4. Marzetti Paolo, Design of a mechatronic device for the analysis of the mastication behaviour (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    - 21.5. Bastianelli Michele, Analysis of controlling a robot with parallel kinematics for innovative applications of interaction with the environment (in Italian), (University Polytechnic of Marche, Ancona, Italy)

21.6. Cesare Sabatino, Proposal of a system for reading and analysis of mandibular kinematics, through mechanical simulator and virtual environment (in Italian), (University Polytechnic of Marche, Ancona, Italy)

22. 1999 M.Sc. Serresi Riccardo, Design procedure of lighting equipment with numerical methods by means of optimization thermofluidodynamic (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    22.1. Franchi Marco, Design methodologies finite elements of toothed belts for the evaluation of stresses and strain generated during the step of meshing (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    22.2. Giovagnoli Gianpaolo, Optimization of the parameters of post-process in selective laser sintering of sand (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    22.3. Gualazzi Fabrizio, Selective laser sintering: characterization and modeling of the mechanism of union between the particles (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    22.4. Guazzaroni Massimo, design and experimental validation of a procedure for the identification and characterization of defects in composite materials using laser Doppler vibrometry and neural networks
    22.5. Bettelli Claudia, Design and development of a theoretical and experimental methodology for the systematic study of the acoustic behaviour of toothed belts (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    22.6. Chiodi Davide, Benchmarking and validation of numerical codes using laser Doppler velocimetry and infrared thermography: application to the design of lighting fixtures (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    22.7. Regno Francesco, Thermal analysis and optimization of the interaction of the accessible parts of a built-in oven (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    22.8. Basili Daniele, Using techniques vibro-acoustic experimental and numerical characterization and modeling of a guard for belt drives (in Italian), (University Polytechnic of Marche, Ancona, Italy)
23. 1998 M.Sc. Licini Licinia, Development and experimental validation of numerical models of synchronous transmission systems for automotive applications (in Italian), (University Polytechnic of Marche, Ancona, Italy)
    23.1. D'Alanno Fabrizio, Static and dynamic study of a synchronous transmission: numerical analysis and experimental validation for the design of new profiles of toothed belts (in Italian), (University Polytechnic of Marche, Ancona, Italy)

Honours and Prizes

Challenges

2020 Finalist Examination, World Robotic Summit 2020 - Industrial Robotics Category Challenge, (date re-scheduled cause of COVID-19 outbreak), Aichi and Fukushima Prefectures September 2021, Aichi, Japan

2018 3rd Place, "IROS 2018 Fan Robotic Challenge", October, 1-5, Madrid, Spain (1k€)

2017 1st Place [IIT+Loccioni], "Grant4Tech Challenge", 17th May, Berlin, Germany (40k€) https://www.youtube.com/watch?v=ExVWy7bIRoQ (short version) https://www.youtube.com/watch?v=s5lQRyMQ1xY (long version)

2008 1st Place, as the best Project of Union Camere National Prix for High School Competition, Verona, 20th November (8k€)

Awards

2022 2nd Place Transfer Technology Award 2022, 29 June 2022, Rotterdam (Netherland) https://www.eu-robotics.net/robotics_forum/awards/techtransfer-award/index.html

2022 1st Place Solution Award (Premio Innovazione Robotica), 10 June 2022, Bologna (Italy) https://www.mecspe.com/it/initiative/solution-award/

2017 The PhD thesis of Maria Laura D'Angelo (IIT) subject "Study of Fingertip Tactile Sensitivity and Mechanical Properties Correlation" has been awarded with Premio Tesi di Dottorato Dario Scapaticci 2017. The announcement took place during the "2017 Mesap conference", 6 July 2017, Turin.

2016 1st Place - Best Application "Aerospace and Defense" Award – National Instruments Engineering Impact Awards 2016, https://www.affidabilita.eu/RepositoryImmaginiEventi/AetCms/file/58_Canali_IIT.pdf

2015 Finalist, World Haptics Student Challenge, "Student Innovation Challenge 2015" held to NorthWestern University, Evanston, IL (USA) from 22nd to 27th of June

2015 1st Place - Best Poster Award – International Conference in Computer Aided Engineering. Pacengo del Garda (VR), Italy

2007-08 Scholarship Winner granted by Antonio Merloni S.p.A. about "New Measurement Techniques without Contact to Design an Innovative Washing machine Dispenser"

2004 Finalist of E-Capital Business Plan Competition with project: "Industrial Network Information Technology Security: Remote Control Service"

2002 PhD Scholarship winner "Mechanical Engineering" at University Polytechnic of Marche (Italy)

2001 Scholarship Winner granted by SAIPEM S.p.A. about "Concurrent Design of an Active Automated System for the Control of Stinger/Pipe Reaction Forces of a Marine Pipelaying System"

1999 PhD Scholarship winner about "Mechanical Measurements Applied to the Engineering" at University of Padua (Italy)

1998 Scholarship Winner granted by MARKIV AUTOMOTIVE S.p.A. about "Numerical Study and Experimental Validation of Synchronous Belts"

1988-1995 Studying Scholarship winner

Invited speaker

1. 2022 *Workshop:* International Workshop on Medical Robotics &Bioengineering – *Strathclyde University, Glasgow, UK, 26th August 2022,*
2. 2022 *Workshop:* Forum Strategico Aerospazio – "Materiali Innovativi per la Robotica: dalla Terra allo Spazio" - *10th June 2022 https://www.regione.emilia-romagna.it/notizie/2021/dicembre/aerospazio-la-regione-insedia-il-forum-strategico-per-promuovere-l-ecosistema-dell-innovazione*

3. 2022 *Workshop:* Workshop CNA – "La Robotica per l'Innovazione della Meccanica" – *TEREX ITALIA - Località Pian D'Assino Nucleo, 12, 06019 Umbertide PG – 19th May 2022* https://www.cnaumbria.it/2022/05/19/la-robotica-per-linnovazione-della-meccanica/
4. 2022 *Workshop:* SME4SMARTCITIES - Commercial Mission in Genova; "Monitoring and Maintenance Robotic System for San Giorgio Bridge, (Genoa, Italy)" – *BIC Genova – 5th April 2022*
5. 2022 *Webinar:* Piano Nazionale Transizione 4.0 – "Le novità introdotte dalla Legge di Bilancio 2022 e le nuove modalità di formazione, aggiornamento e riqualificazione professionale sulle tematiche del paradigma Industria 4.0" – *Marche Polytechnic University – 15th February 2022*
6. 2022 *Keynotes:* "Inspection, Monitoring and Maintenance Robotic System for San Giorgio Bridge" – *SEBPP (South East Bridge Preservation Partnership - USA) - Bridge Inspection Program Manager Working Group – 25th January 2022*
7. 2021 *Workshop:* "All we want for Christmas is a circular world!" - "From Research to the Market: Robot into the Plant for Sustainable Manufacturing Processes" – *STAM - 14th December 2021*
8. 2021 *Workshop:* "Construction Blueprint: evento di endorsement online" - "Tavolo sulla Digitalizzazione" – *ANCE Evento Online - 10th December 2021* www.ance.it - http://constructionblueprint.eu/
9. 2021 *Workshop:* "Mostra Convegno Automazione, Strumentazione, Sensori" - "I robot Collaborativi per l'Automazione e la Manutenzione Industriale: stato dell'arte, tecnologie e nuovi sviluppi" – *Verona Fiere 27th October 2021* https://www.verticale.net/meccatronica-cognitiva-sulle-linee-di-processo-produttivo-25080
10. 2021 *Workshop:* "Shipping 4.0" - "Think tank 3", *27th Maggio 2021*
11. 2021 *Workshop:* "Shipping 4.0" - "Tavola Rotonda: I porti" https://shipping-40.sharevent.it/it-IT/sessions/22011, *10th February 2021*
12. 2020 *Webinar:* "RAMTech Expo" - "La Ricostruzione del Viadotto Polcevera dell'autostrada A10" https://www.remtechexpodigitaledition.it/territorio-rischi-naturali-infrastrutture/ponte-genova/, *23rd September 2020 (online)*
13. 2020 *Webinar:* "RAMTech Expo" - "Ricerca, Sviluppo e Tecnologie nelle infrastrutture e nelle costruzioni dell'Italia del futuro" https://www.remtechexpodigitaledition.it/territorio-rischi-naturali-infrastrutture/ricerca-sviluppo-e-tecnologie-nelle-infrastrutture-e-nelle-costruzioni-dellitalia-del-futuro/ , *21st September 2020 (online)*
14. 2020 *Workshop:* "Appuntamenti Digitali" - SPS Italia (Messe Frankfurt Italia) "La continua evoluzione della robotica industriale" https://www.spsitalia.it/it/continua-evoluzione-robotica-industriale, *18th June 2020 (online)*
15. 2019 *Exposition:* "Umbria Technology Forum: a Perugia le imprese incontrano Competence Center e centri di ricerca", *19th November 2019, Perugia (PG), Italy*
16. 2019 *Seminar:* "L'avvento della Robotica Umanoide nell'Industria 4.0" - *"24ª edizione del Salone della Scuola, della Formazione, dell'Orientamento e del Lavoro" – 12th November 2019, Genova (GE), Italy*
17. 2019 *Workshop:* "Robotica - Controlli qualità → Casi di successo, insuccessi, opportunità è difficoltà" - *III Convivio Decathlon Produzione Italia, 18th July 2019, Genoa (GE), Italy*
18. 2019 *Workshop:* "Intelligenza Artificiale per l'allocazione dei compiti in operazioni di assemblaggio collaborativo" - *Automazione 5.0 – L'uomo, l'Intelligenza artificiale ed il robot, 2nd July 2019, Milano (MI), Italy*
19. 2018 *Workshop:* "Advanced Industrial Automation Lab Activities" - *Quota 8000: Service Innovation HUB - AI Service. Un patto storico tra noi e le machine, 5th December 2018, Genova (GE), Italy*
20. 2018 *Workshop:* "Cobots" - *PIDcaffè & AperiPID, Punto Impresa Digitale, Camera di Commercio Genova, 28th November 2018, Genova (MI), Italy*
21. 2018 *Workshop:* "Cognitive Era: IoT, Big Data e Artificial Intelligence" - *Proiezioni verso un futuro cyber fisico, Confidustria Vicenza, 18th October 2018, Vicenza (MI), Italy*

22. 2018 *Workshop:* "L'introduzione in Azienda dei Robot Collaborativi" – *Workshop Tematici, Digital Innovation Hub Liguria, 9th November 2018, Savona (SV), Italy*
23. 2018 *Workshop:* "Robotica e l'Industria Italiana" – Strategie di Sviluppo nei 4 Settori di Eccellenza Italiana", *ZERO IN: EXCELLENCE, 10th October 2018, Milano (MI), Italy.* *https://www.rossocorsa.it/eventi/11/Excellence-in-Fabricated-Machinery*
24. 2018 *Workshop:* "Robotics and Industry 4.0" – "Convegno AGI: Diritto del lavoro, intelligenza artificiale e robotica industriale", *Associazione Giurisprudenzialisti Italiani, 1st October 2018, Milano (MI), Italy.* *http://fp-lex.it/fp_upl/news/AGIL-Manifesto-01-ottobre-2018.pdf* *https://www.lineapelle-fair.it/uploads/lineapelle/Programma_Innovation_Square.pdf*
25. 2018 *Workshop:* "Robotics and Industry 4.0" – *LineaPelle Innovation Square, 27th September 2017, Milano Fiere, Rho (MI), Italy, https://fashioninnovation.it/oratori-agenda/*
26. 2018 *Seminar:* "Robotica and Industry: IIT Transfer Technologies Activities" - *II Convivio Decathlon Produzione Italia, 18th July 2019, Milan (MI), Italy*
27. 2018 *Workshop:* "La Robotica IIT per l'industria" – *Consorzio Intellimech, 26th February 2018, Baccanello (BG), Italy.*
28. 2017 *Workshop:* "Dalla ricerca Robotica di oggi all'Industria di domani" – *Coffee Tech in Confidustria, 16th May 2017, Genova (GE), Italy.* *https://www.confindustria.ge.it/impresa/tecnologia-ricerca-e-innovazione/ricerca-e-innovazione/22173-invito-coffeetech-dalla-ricerca-robotica-di-oggi-all-industria-di-domani.html* *http://www.dihliguria.it/servizi-2/itemlist/category/12-servizi.html*, https://www.facebook.com/confindustriagenova/videos/coffeetech-026-con-ferdinando-cannella-e-carlo-brindisi-canali-iit-su-robotica-d/926115604193227/
29. 2017 *Workshop:* "Le tecnologie IIT per l'industria 4.0" – *Confidustria, 7th February 2017, Pescara (PE), Italy.*
30. 2016 *Workshop:* "Tecnologia che supporta l'uomo, non lo sostituisce: Il mio collega robot" – *27th October 2016, Ferrowine - Castelfranco Veneto (TV)* *http://www.t2i.it/seminari_t2i/schedaSeminario.asp?ID=575*
31. 2016 *TED* Expandere 2016 - Ferdinando Cannella, Istituto Italiano di Tecnologia - *IIT, Gruppo di Advanced Robotics. Le nuove frontiere della robotica e della meccanotronica. 23th June 2016 - Abbazia di Fiastra, Macerata.* *http://www.synbiotec.com/wp-content/uploads/2017/07/exinn2016.pdf* *http://www.macerata.confartigianato.it/wp-content/uploads/2016/06/Programma-Expandere2016-agg.pdf*
32. 2016 *Workshop:* "La robotica come ricerca per le tecnologie del future" – *"Tecnologie Additive: la rivoluzione dell'industria manifatturiera" 26th April 2016, Recanati (MC), Italy.* *https://www.confindustriasi.it/files/File/Confindustria%20-%20%20Comitati%20Tecnici/Loc_Tecnologie_additive_RECANATI.pdf*
33. 2014 *Research Seminar* "In-Hand Precise Twisting and Positioning by a Novel Dexterous Robotic Gripper for Industrial High-Speed Assembly", *8th June 2015, Faculty of Mechanical Engineering and Mechanics, Ningbo University, Ningbo, China.*
34. 2014 *Research Seminar* "In-Hand Precise Twisting and Positioning by a Novel Dexterous Robotic Gripper for Industrial High-Speed Assembly", *6th June 2014, School of Mobile Information and Engineering, Zhuhai Campus, Sun Yat-Sen University, Zhuhai, China.*
35. 2014 *Research Seminar* "Haptic Research towards the Medical Screening and Caring", *5th June 2015, Medical Science, Guangzhou North Campus, Sun Yat-Sen University, Guangzhou, China.*
36. 2014 *Giornata dell'Energia:* "Prototipazione virtuale applicata al risparmio delle risorse nell'Automazione Industriale", *27th January, Rimini, Italy.*
37. 2014 *Workshop:* "Gli ultimi risultati della ricerca nel campo della robotica" - *"Il Nostro Territorio, le Nuove Frontiere della Meccatronica: dall'Automazione alla Robotica: il Lavoro nel Futuro", 12th April 2014, Osimo (AN), Italy.* *http://www.anconatoday.it/eventi/isis-osimo-castelfidardo-nuove-frontiere-meccatronica.html*
38. 2013 *Packology Expo:* "PackFlex: Prototipazione Virtuale Applicata alla Flessibilità delle Macchine per il Packaging", *12th June, Rimini, Italy.*
39. 2013 *AlmaTec Information Day*: "Integrated Virtual Environment: Multidisciplinary Approach in the Team Design Analysis", *27th March, Modena, Italy.*

40. 2012 *MSC.Software University RoadShow:* "The Simulation Border in Machinery: from design to tuning of Mechanism and Machines", *8th June, Politecnico di Milano, Italy.*

41. 2011 *CRIT Research™ Seminar:* "Multibody Analysis: how to design and validate the numerical model", *26th October, Vignola (MO), Italy.*

42. 2009 *ReMAR Workshop:* Reconfigurable Mechanism for Milk Carton Folding, London (UK), 21st June.

43. 2006 *KCL seminar:* Stiffness Modelling and Kinematic Analysis of Carton Handling and Manipulation with a Reconfigurable Mechanism using Numerical Simulation, *London (UK), 15th March.*

44. 2001 *KCL seminar:* "Virtual Prototyping applied to the Timing Belt Design", *London (UK), 21st June.*

Scientific Organisation

Conference Committees

2023	ARSO	IEEE Workshop on Advanced Robotics and its Social Impacts, Berlin (Germany)	Associated Editor (IEEEXplore)
2018	ARSO	IEEE Workshop on Advanced Robotics and its Social Impacts, Genoa (Italy)	Associated Editor (IEEEXplore)
2018	ReMAR	IEEE/IFToMM International conference on Reconfigurable Mechanisms and Robots, Delft University, Delft (Netherland)	Associated Editor (IEEEXplore) Programme Committee Member
2018	ROBIO	IEEE International Conference on Robotics and Biomimetics, Kuala Lumpur (Malaysia)	Associated Editor (IEEEXplore) Programme Committee Member
2017	ROBIO	IEEE International Conference on Robotics and Biomimetics, Macau (China)	Programme Committee Member
2016	ROBIO	IEEE International Conference on Robotics and Biomimetics, Qingdao (China)	Programme Committee Member
2015	ROBIO	IEEE International Conference on Robotics and Biomimetics, Zhuhai, Guangzhou (China)	Programme Committee Member
2012	ReMAR	IEEE/IFToMM International conference on Reconfigurable Mechanisms and Robots,Tianjin University, Tianjin (China)	Programme Committee Member Regional Chair Session Chairman
2009	ReMAR	IEEE/IFToMM International conference on Reconfigurable Mechanisms and Robots,King's College of London (UK)	Session Chairman
1998-2006	AIVELA	Italian Association of LAser VElocimetry and non-invasive diagnostics University Polytechnic of Marche	Organiser Committee Member

Workshops and Tutorials

2022 Tutorial: Girl & Science – "Delightful Mechatronics...alias Fun with Robotics" – Liceo Pigafetta Vicenza, *26th March 2022* and Lioy Vicenza,*10th May 2022*, Organizers: Ferdinando Cannella, Mariapaola D'Imperio, Haider Abidi and Eleonora Fontana, https://www.apindustria.vi.it/comunicati-stampa/8991-al-via-il-progetto-girls-and-science-per-promuovere-la-formazione-stem-tra-le-studentesse.html

2021 *Workshop*: 1st Worldwide Autonomous Robot for Infrastructures I&M: Genova San Giorgio Bridge - European Robotic Forum, *May 2021* – Online, Organizers: Ferdinando Cannella, Emanuele Frontoni, Mariapaola D'Imperio, Adriano Mancini, https://www.eu-robotics.net/robotics_forum/upload/erf2021/ERF2021-programme.pdf

2019 *Tutorial*: 5th Tutorial on Multibody Flexible Robot Design (https://event.asme.org/Events/media/library/resources/idetc-cie/IDETC-Workshops-Tutorials.pdf) ASME 2019 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), Anaheim, California, USA, *August 18-21, 2019* http://www.mscsoftware.com/it/page/istituto-italiano-di-tecnologia-tutorial-multibody-flexible-robot-design-idetccie

2018 *Tutorial*: 4th Tutorial on Multibody Flexible Robot Design (https://archive.asme.org/events/idetccie2018/program/workshops-tutorials) ASME 2018 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), *August 25-29, 2018*, Quebec City, QC, CANADA, *August 25-29, 2019* http://www.mscsoftware.com/it/page/istituto-italiano-di-tecnologia-tutorial-multibody-flexible-robot-design-idetccie

2018 *Workshop:* "III Convivio Decathlon Produzione Italia, 18th July 2019, Genoa (GE), Italy

2018 *Workshop*: "How far/close is the Robotics from the Agriculture 4.0?", 9th edition of European Robotics Forum 2018 (ERF2018) Tampere, Finland, *March 13-15, 2018.*

2017 *Tutorial*: Design of MultiBody Legged Robots (https://www.asme.org/wwwasmeorg/media/resourcefiles/events/fpmc/asme_idetc-cie_program17.pdf) ASME 2017 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), *August 6-10, 2016*, Cleveland, OH, USA

2016 *Workshop*: "From Laboratory Test Rigs to Clinical Applications in Peripheral Neuropathies Diagnosis", 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'16), Orlando FL (USA), *August 16, 2016, 2016*. Organizers: Ferdinando Cannella, Paolo Liberini, Maria Laura D'Angelo

2016 *Workshop*: "Collaboration in Industry 4.0: Human, Robot and Flexible Processes", 7th edition of European Robotics Forum 2016 (ERF2016) Ljubljana, Slovenia, March21-23, 2016. http://www.robo-partner.eu/events/european-robotics-forum-2016-session-collaboration-in-industry-4.0-human-robot-and-flexible-processes

2016 *Tutorial*: Flexible Robot Virtual Prototyping Design and Control (https://www.asme.org/wwwasmeorg/media/ResourceFiles/Events/AM3D/Workshops2016.pdf) ASME 2016 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 21-25, 2016, Charlotte, NC, USA

2015 *Workshop*: "Flexibility and dexterity in industrial robots: Demonstrators of new frontiers in industrial applications" 6th edition of European Robotics Forum 2016 (ERF2016), March 11-13, 2015, Wien (Austria)

2015 *Tutorial*: "Robot Limb: Virtual Prototyping Design and Control" (https://www.asme.org/events/idetccie/program/workshops-tutorials), ASME 2015 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 2-5, 2015, Boston, MA, USA

Seminars

2019 Prof. Andreas Muller (Full Professor, Head, Institute of Robotics, Johannes Kepler University, Linz, Austria) "Identification and Model-Based Control of Robots", October 11th 2019

2019 Prof. Gianluca Rossi, (Full Professor of "Mechanical and Thermal Measurements" and Head of Industrial Department at University of Perugia, Italy), "Development of non-contact measurement techniques for qualification of additive manufactured trabecular structures of robotic components", July 11th, IIT, Genova (Italy)

2019 Prof. Ville Kyrki, (Associate Professor, Department of Electrical Engineering and Automation, Aalto University, Aalto, Finland) "Complexity trade-offs for robot motion and manipulation skills", July 11th, IIT, Genova (Italy)

2018 Prof. Gianluca Rossi, (Full Professor of "Mechanical and Thermal Measurements" and Head of Industrial Department at University of Perugia, Italy), "Mechanical Systems Model Verification and Validation: Non-contact Measurements Frontiers", November 16th, IIT, Genova (Italy)

2018 Robots 360°

2017 Dr. Cristina Cristalli, (Director for Innovation, Loccioni, Angeli di Rosora (AN), Italia) "Challenges and opportunities in robotic technology transfer from academia to industry. The experience of Loccioni.", October 19th, IIT, Genova (Italy)

2017 Robots 360°

2017 Prof. Giancarlo Genta, (Politecnico di Torino) "Human missions to Mars: cooperation between astronauts and robots", March 1st, IIT, Genova (Italy)

2017 Dr. Angelo Narducci, (Ferrari, Maranello (MO), Italy) "HMI: car design methodology using the crash test dummies", November 6th, IIT, Genova (Italy)

2016 Robots 360°

2016 Dr. Luca Castignani, (Ferrari – MSC Software, USA) "Simulation Activities in Ferrari Sportscar Development", February 10th, IIT, Genova (Italy)

2016 Prof. Jian S. Dai (King's College of London, London, UK), "Kinematics Entails Reconfigurable Mechanisms", January 26th, IIT, Genova (Italy)

2015 Dr. Lorenzo Benetton e Ing. Federico Urban (EnginSoft, Trento, Italy), Tecnologia modeFRONTIER e competenze EnginSoft, IIT, Genova (Italy), 27th May 2015 https://www.esteco.com/sites/default/files/Workshop_modeFRONTIER_2015_GenovaLR.pdf

2012 Dr. Roberto Bernetti (Marche Polytechnic UniversityMarche Polytechnic University, Ancona, Italy): "Finite Element Analysis applied to the robotics", IIT, 21st March, Genova (Italy)
2012, Dr. Angelo Arleo (Pier and Marie Curie University, Paris, France): "Code and Decoding", IIT, Genova (Italy)
2011 Dr. Daniele Catelani (MSc.Software, Turin, Italy): "Multibody simulation applied to robotics", IIT, Genova (Italy)

Expositor

2022 **Festival della Scienza**, October 20 – November 1, Genoa (Italy)
2022 **Make Faire**, October 7-8, Rome, RM (Italy)
2022 **Festival dello Spazio**, June 30 – July 3, Busalla, GE (Italy)
2022 **European Robotic Forum**, June 28-30, Rotterdam (Netherland)
2022 **MECSPE**, June 9-11, Bologna (Italy)
2019 **European Robotic Forum**, March 21-23, Bucharest (Romania)
2018 **IBA**, September 15-20, Monaco (Germany) – [with Novacart]
2018 **European Robotic Forum**, March 13-15, Tempere (Finland)
2017 **InterPack**, May 4-10, Dusseldorf (Germany)
2014 **SPS IPC Drives Italia**, May 22-24, Parma (Italy) – [with Moog]
2013 **Packology** 12th June 10-12, Rimini (Italy)

Associate Editor of Scientific Journals

- Proceeding of the iMeche, Part C: Journal of Mechanical Engineering Science (SAGE)
- Frontiers in Mechanical Engineering (Guest Associated Editor, Mechatronics)

Reviewer

Journals

1. Advances in Mechanical Engineering (SAGE)
2. Applied Sciences (MDPI)
3. Frontiers in Neurology (Frontiers)
4. Frontiers in Mechanical Engineering (Frontiers)
5. Frontiers in Robotics and Innovative Manufacturing in Architecture and Structural Design (Frontiers)
6. Frontiers in Neurorobotics (Frontiers)
7. IEEE Transactions on Automation Science and Engineering (IEEE-RAS)
8. IEEE/ASME Transactions on Mechatronics (IEEE Industrial Electronics Society, IEEE Robotics and Automation Society, IEEE Lasers and Electro-Optics Society, ASME Dynamic Systems and Control Division, and ASME Design Engineering Division)
9. IEEE Transactions on Haptics (IEEE-RAS)
10. IEEE Transactions on Neural Systems & Rehabilitation Engineering (IEEE-EMB)
11. IEEE RA-L (IEEE-RAS)
12. IEEE Transactions on Robotics (IEEE-RAS)
13. Journal of Systems Science (IEEE-RAS)
14. Journal of Robotics (Hindawi)
15. Journal of Intelligent and Robotic Systems (Springer)
16. Mechanism and Machine Theory (Elsevier)
17. Multibody System Dynamics (Springer)
18. Robotics (MDPI)
19. Robotics and Autonomous Systems (Elsevier)
20. Robotics and Computer-Integrated Manufacturing (Elsevier)
21. ROBOMECH Journal (Springer Open)

22. Sensors (MDPI)

Conferences

- ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE)
- IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications (MESA)
- IEEE International Conference on Advanced Intelligent Mechatronics (AIM)
- IEEE International Conference on Automation Science and Engineering (CASE)
- IEEE International Conference on Intelligent Robots and Systems (IROS)
- IEEE International Conference on Robotics and Automation (ICRA)
- IEEE Conference on Robotics and Biomimetics (ROBIO)
- IEEE/RAS-EMBS International Conference on Rehabilitation Robotics (ICARR)
- IEEE/SICE International Symposium on System Integration (SII)

Challenge Jury Panel

2018 "Premio Innovazione Robotica", member of Comitato Tecnico Scientifico (CTS) – 23th March, MECSPE, Parma (PR), Italy

Profiles:

https://www.linkedin.com/in/ferdinando-cannella-487a78a7/
https://publons.com/researcher/3585193/ferdinando-cannella/
https://www.researchgate.net/profile/Ferdinando_Cannella
https://scholar.google.com/citations?user=VwcEJKkAAAAJ&hl=en
https://www-scopus-com.biblio.iit.it/authid/detail.uri?origin=resultslist&authorId=14420714300&zone=
https://orcid.org/my-orcid?orcid=0000-0001-7602-1850
https://github.com/FerdinandoCannella

Publications:

Scientific Metrics (March 2022)

	h-Index	Documents	Citations
Scopus	15	96	1111
Google Scholar	16	111	1520
ResearchGate	16	111	1265

VIDEO LINKS

Websites

- https://www.mscsoftware.com/it/page/development-3-dof-under-actuated-leg-using-multidiscipline-simulation

Press Review:

1. 2021/02/17 **[SofManBot] Alicante Plaza,** Aiju e Inescop completan sus pruebas para crear un robot avanzado que manipule materiales blandos, https://alicanteplaza.es/aiju-inescop-completan-pruebas-robot-materiales-blandos
2. 2021/01/07 **[SofManBot] Ediciones Sibila,** INESCOP investiga con el proyecto Softmanbot la robotización de la tarea de desmoldado de suelas, https://www.edicionessibila.com/es/actualidad/calzado/inescop-investiga-con-el-proyecto-softmanbot-la-robotizacion-de-la-tarea-de-desmoldado-de-suelas
3. 2020/07/19 **Giornale di Brescia,** Camozzi si aggiudica l'Open Innovation
4. 2020/07/19 **Giornale di Brescia,** Camozzi si aggiudica l'Open Innovation
5. 2020/07/19 **[SofManBot] Giornale di Brescia,** Camozzi si aggiudica l'Open Innovation
6. 2020/11/26 **Ancona Today,** Camozzi si aggiudica l'Open Innovation
7. 2020/10/16 **[SofManBot] Revista del Calzado,** Inescop trabaja en un robot para la extracción de pisos inyectados, http://revistadelcalzado.com/inescop-softmanbot-robot-zapatos-pisos-inyectados/
8. 2020/10/07 **[IRCRAM] Giornale di Brescia,** Camozzi si aggiudica l'Open Innovation
9. 2020/07/19 **[SofManBot] Alicante Plaza,** Aiju e Inescop trabajan en un robot para la manipulación de materiales blandos en fabricación, https://alicanteplaza.es/aiju-inescop-trabajan-en-un-robot-para-la-manipulacion-de-materiales-blandos-en-los-sectores-de-fabricacion
10. 2020/07/06 **[SofManBot] Engineering Update,** Zimmer Group Contribute To Eu Softmanbot Research Project, https://engineering-update.co.uk/2020/07/06/zimmer-group-contribute-to-eu-softmanbot-research-project/
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10. 01/10/2018 - In vigore il Dl emergenze, tutte le misure per Genova, Ricostruzione ponte: sì all'affidamento diretto e in deroga al Codice Appalti; escluse tutte le imprese coinvolte in società concessionarie di strade a pedaggio
11. 26/09/2018 - Crollo Ponte Morandi, MIT accusa Autostrade: 'interventi insufficienti e inappropriati', La Commissione ispettiva ha registrato un avanzato stato di corrosione e problemi negli elementi strutturali
12. 19/09/2018 - Renzo Piano presenta il suo ponte per Genova. I disegni, "Sarà un ponte di acciaio sfavillante e limpido come una nave"

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Patents

1. *In writing – Diabetic Foot Automatic Tactile Sensitivity Assessment*
2. *In process - Robot for automatic Inspecting and Maintenance for infrastructure*
3. *Submitted - Lateral gripper for setting objects upright*
4. CN114380098A;EP3988484A1;US2022119214A1 - (Double Tape Dispenser) A Method and Apparatus for Preparing Edges of Reels of Web Material
   https://worldwide.espacenet.com/patent/search/family/074068595/publication/EP3988484A1?q=pn%3DEP3988484A1
5. CN114380118A;EP3988486A1;US2022119216A1 - (Grasping and Cutting Unit) An Apparatus and Method for Dispensing Sections of Double-Sided Adhesive Tape
   https://worldwide.espacenet.com/patent/search/family/074068597/publication/EP3988486A1?q=pn%3DEP3988486A1
6. IT201900011295A1;WO2021005521A1- System and Method for Inspecting and Maintenance of the Bridges
   https://worldwide.espacenet.com/patent/search/family/068426740/publication/WO2021005521A1?q=WO2021005521)
7. IT 102019000000955 - Equipment for Objects Orientation,
   https://worldwide.espacenet.com/patent/search/family/081074457/publication/IT201900025537A1?q=pn%3DIT201900025537A1
8. EP3609386A1;IT201700041851A1;US2020046292A1;WO2018189715A1 - Device for Detecting the Tactile Sensitivity of a User
   https://worldwide.espacenet.com/patent/search/family/059746298/publication/IT201700041851A1?q=201700041851

Member of Scientific Societies

- Member of the IEEE Society
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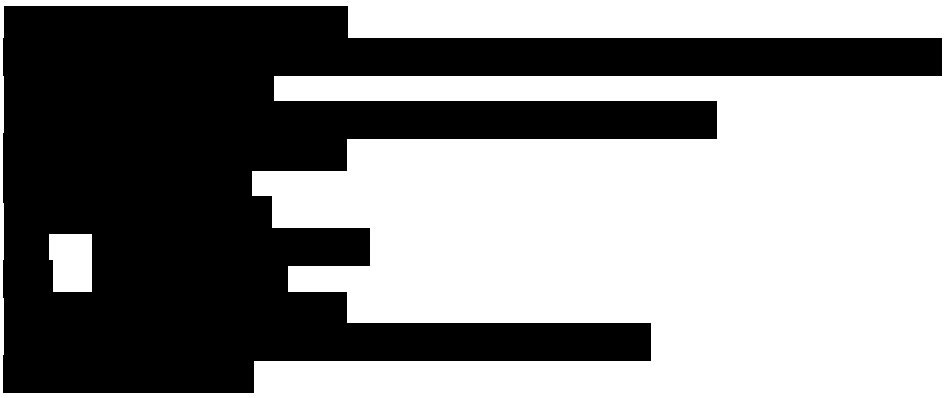
- Member of the EMB Society

Attended Courses

- EnginSoft-ESTECO, **Virtual Prototyping Design Optimization with ModeFRONTIER**, Dr. Vito Primavera, June 2019, Genoa, (Italy)
- EnginSoft-ESTECO, **Virtual Prototyping Design Optimization with ModeFRONTIER**, Dr. Federico Urban and Dr. Lorenzo Benetton, 27th May 2015, Genoa, (Italy)
- MSC.Software, **Engineering Lighter and Faster Industrial Robots by Performing**, Yijun Fan, 30th April 2015, Webinar
- EnginSoft, **Ottimizzare le risorse di calcolo con ModeFRONTIER attraverso le superfici di risposta**, Ing. Federico Urban, 3rd December 2014, Webinar
- EnginSoft, **Workbench Seminar Nonlinear,** Ing. Daniele Calsolaro, 15th October 2013, Webinar
- EnginSoft, **Workbench Seminar Dynamics,** 2nd July 2013, Webinar
- EnginSoft, **Workbench Seminar Coupling Tolerance,** 12th June 2013, Webinar
- EnginSoft, **Workbench Seminar Finite Element Meshing,** 30th May 2013, Webinar
- MSCsoftware, e-Xstream, **Multi-scale modeling of composite materials & structures in the automotive industry**, Mira Toth, Kurt Danielson, 26th February 2013, Webinar
- UCLouvain: **RoboTran basic and advanced course,** Nicolas Docquerier and Paul Fisette, (RoboTran UC Louvain, Belgium), Genoa (GE), 27th-30th August 2012
- AlmaTec: **Kinematic and Dynamic Analysis Control using MSC.ADAMS,** Lorenzo Zamparo (AlmaTec, Tavagnacco UD, Italy), Genoa (GE), 25th-27th July 2012
- NAFEMS: **Dynamic Finite Element Analysis,** Tony Abbey (FETraining, USA), e-learning, December 2010 – January 2011
- CILEA: **NonLinear Analysis via Finite Element Model**, Lorenzo Zamparo (AlmaTec, Tavagnacco UD, Italy), Segrate (MI), 22-24th June 2010
- IIT: **Introduction to the Analysis and Control of Advanced Robotic Systems**, Edward Grant (NC State University, USA), Genova (GE), 4-16th June 2010
- CILEA: **MSC.Software: Patran e MD Nastran Linear Analysis**, Lorenzo Zamparo (AlmaTec, Tavagnacco UD, Italy), Segrate (MI), 17-19th November 2009
- MSC.Software: **Motion Technology Day with Adams**, Modena, 29th October 2009
- Consorzio TCN: **Minimaster in Mechatronica**, F. Previdi, C. Spelta (Università BG, Italy), S. Savaresi, F. Casella (Politecnico di MI, Italy), Orbassano - TO, 23-27th March 2009.
- Comsol ITALIA: **ComSol Multiphysics,** G. Zanotelli (ComSol Italy) C. Tozzo (ComSol, Italy), Brescia, 11-13th September 2007
- Consorzio TCN: Training on use of **ModeFrontier**, M. Noris (EnginSoft BG, Italy), Bergamo, 20-21th November 2006.
- Consorzio TCN: **Analisi dinamiche con modelli ad elementi finiti**, R. Gonella, C. Polese (EnginSoft BG, Italy), Bergamo, Italy, 10-11th November 2004.
- Department of Mechanics (Università Politecnica delle Marche): **Fracture and Fatigue**, Daniel Eylon (University of Dayton, Ohio, USA), Ancona, Italy, 3-9th June 2004.
- MSC Software: **Fatigue Analysis of Dynamically Responsive Systems Using FEA**, M. Veltri (MSC.Software, Italy), NWM Bishop (Random Loading Design, Ltd, Surrey, UK), Torino, Italy, May 2004
- Department of Mechanics (Università Politecnica della Marche): **Stress Relaxion in Solids**, P. Lukac, Z. Trojanova (Charles University of Prague, Czech Republic), Ancona, Italy, 26th September 2003.
- NAFEMS: **Introduction to numerical models for contact problems with friction and thermo-mechanical coupling**, G. Zavarise (Politecnico di Torino, Italy), P. Wriggers (Universität of Hannover, Germany), Bergamo, Italy, 10-11th October 2000;
- NAFEMS: **Finite element method on linear problems**, A. Fusco (Università di Trento, Italy), Bergamo, 8-9th July 2000;
- FLUENT: **Fluent software to fluid-dynamic modelling**, Milano, 19-22th May 1999.
- Mechanical Dynamics: **ADAMS multibody software advanced Training**, J. Slattengren (MD Sweden), Malmö, Sweden, 11-12th December 1999;
- ESPRI-MARC: **Trainings on the use of MARC, FEA software for friction and thermo-mechanical coupling**, F. Mariani, C. Bruzzo (Espri-MARC, Italy), Genova, 1999;
- ESPRI-MARC: **Trainings on the use of MARC, FEA software, for analyses with elastometers, for contact analyses,** F. Mariani, C. Bruzzo (Espri-MARC, Italy), Genova, 1997;

- Mechanical Dynamics: **ADAMS multibody software Basic Training**, J. Slattengren (MD Sweden), Ancona, 7-10th July 1997

Skills with commercial software

- **Operative systems:** Windows 3.11-95-98-NT-2000-ME-XP-Vista-7-8-10, Linux, Unix (Digital), DOS
- **CAD:** SolidWorks2017, CREO, Solid-Edge19, AutoCad2009,
- **FEA Software:** MSC.Nastran2019, MSC.Patran2019, ANSYS and WorkBench19, MSC.MARC2017, MSC.SuperForm, Pro/MECHANICA, COSMOSwork2012, COSMOSmotion2012, DEFORM, Comsol Multiphysics, LMS Virtual Lab Motion and Acoustic, SysStus, Sap90, SAP2000.
- **CFD:** CFX, Flotran, Fluent
- **Multibody Packaging:** MSC.ADAMS2020, RoboTran2012, MSC.VisualNastran4D 2004, WorkingModel
- **Programming Languages:** APDL, PCL, VBA, C++, Turbopascal, VisualBasic, Fortran77, Matlab, LabView.